SEP 28 1984 304

NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

19136 W.

FACILITY NAME (1): Yankee Nuclear Power Station Rowe, Mass.

DOCKET NUMBER (2): 0 5 0 0 0 0 2 9

PAGE (3): 1 OF 0 3

TITLE (4): 480 Volt Bus ~~4-1~~ Failure

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
0 8	0 2	8 4	8 4	— 0 1 3	— 0 0	0 8	3 1	8 4		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9): 1

POWER LEVEL (10): 1 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
20.405(a)(1)(v)	50.73(a)(2)(iii)	X 50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME: Edwin L. May, Plant Engineer

TELEPHONE NUMBER: AREA CODE 4 1 1 3 — 4 2 4 - 5 2 6 1 1

TRP 10.18.84

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
B	E C	B K R	W 1 2 0	N					

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

During normal operation in Mode 1 a fault occurred in the 480 Volt supply ACB to Bus 4-1 that resulted in 4-1 bus isolation, fire detection initiation and Halon discharge. The Fire Brigade responded as required, and an Alert condition was declared and terminated approximately 70 minutes later.

A controlled plant shutdown in accordance with Tech. Specs. was initiated to affect repairs.

The cause of the fault has been attributed to high resistance in the main disconnecting contacts of the center phase of the ACB which caused an arc to propagate to the outside phases. The high resistance was probably caused by failure of the contact retainer ring on the finger cluster of the Westinghouse DB-50 ACB.

Two DB-50 ACBs were replaced along with associated cubicles, relays, switches and wiring. Finger clusters on three more DB-50 ACBs were replaced with a new type not subject to this type of failure. All other DB-50 and DB-25 ACBs were given a complete inspection to verify that no failure prone type finger clusters are now in service.

Therefore, there is no adverse affect to the Public Health and Safety.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

At 1015 hours, during normal operation in Mode 1, while starting No. 2 LPSI pump for surveillance, a fault occurred in the supply breaker to the 4-1 480 volt bus (Breaker 448) and a fire ensued. The electrical distribution system's selective tripping functioned properly and the 4-1 bus was isolated. Breaker number 448 connects Number 4 Station Service Transformer to Non-Safety Related 480 Volt bus Section 4-1. The No. 2 LPSI pump is on a safety related bus which is powered from the 480 volt bus Section 4-1. Two security officers were in the switchgear room at the time of the occurrence and re-reported a fire to the Control Room. The fire detection system went into an alarm condition and actuated the automatic Halon fire suppression system. The Halon suppression system extinguished the remaining fire. The Fire Brigade responded, verified that the fire was out, investigated the source of the fire, and determined the extent of damage. This information was reported to the Control Room. One of the Operation's personnel on the Fire Brigade racked the breaker off the bus. The switchgear room was then ventilated to remove smoke. At 1057 hours an Alert was declared and all appropriate notifications were made. At 1115 hours a continuous fire watch was posted in the Switchgear Room. At 1145 hours a controlled plant shutdown was commenced in accordance with Technical Specification 3.8.2.1, and at 1205 hours the Alert was secured. The fire detection system was returned to normal at 1440 hours.

The cause of the occurrence has been attributed to above normal electrical resistance in the main disconnecting contacts of breaker 448. The resistance caused the fault when the contacts were called upon to carry the starting current of the LPSI pump motor. The fault occurred in the center phase and propagated to the adjacent phases. Cracking in the retainer of the contact fingers is the most likely cause of the above normal resistance connection; however, all evidence of this was destroyed by the fault. The initial energy release by the fault resulted in damage to the metal enclosure of the breaker, damage to the bus tie breaker below from the falling debris, and ignition of the control cable insulation. The fire damage consisted of burnt wire insulation in the three cubicles in this section of the switchgear, meter and relay covers outside the switchgear and damage to the outer covering of a few control cables in overhead cable trays.

All of the breakers on the 4-1 bus were removed. The enclosures and cables of the bus were cleaned, the 4-1 bus was meggered and energized via the 4648 breaker at 2140 hours on August 3rd. After the individual breakers were cleaned, inspected and tested they were placed into operation. The No. 4 Station Service Transformer that supplies the 4-1 bus was tested to determine if it had sustained any damage. No indication of damage was found. The control cables in the overhead cable trays, which showed some signs of heat damage, were replaced. All the other breakers in the 480 Volt buses 5-2 and 6-3 were inspected and tested satisfactorily. The three enclosures in the section of the switchgear which house the two breakers, 448 and 4548, and associated relays were all replaced in kind. The Halon fire suppression system was recharged and made operational on August 9, 1984. Finger clusters on three more DB-50 ACBs were replaced with a new type not subject to this type of failure. All other DB-50 and DB-25 ACBs were given a complete inspection to verify that no failure prone type finger clusters are now in service. All repairs were completed and the system returned to normal at 1900 hours on August 13th. The plant returned to power operation on August 15, 1984 at 1808 hours. An infra red thermo scan of the bus room was performed on August 24, 1984, to verify that no hot spots were occurring.

Our engineering staff reviewed the sequence of events during this occurrence and believes that a relay which monitors the current between No. 4 Station Service Transformer and circuit breaker number 448, sensed the short circuit and tripped breaker number 448.

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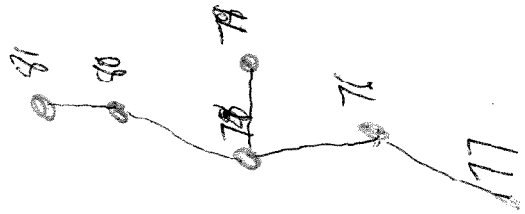
TEXT (If more space is required, use additional NRC Form 366A's) (17)

However, since the fault was on the incoming side of the breaker, the system was still feeding the fault. A second relay which senses the current between No. 1 and No. 4 Station Service Transformers, was set to clear a fault by tripping the OCBs and the generator. However, before this relay operated, the fault cleared itself by melting the connection between the circuit breaker and the incoming cables.

Our Engineering staff has reviewed the design and operation of this relay scheme. They also conferred with relay experts from the New England Power Service Company (NEPSCO). It was determined that the protective relaying scheme operated correctly, according to design. Furthermore, the design is conventional and provides adequate protection for the station.

All personnel, systems and protective features performed as required. There was no adverse effect to the public health or safety as a result of this occurrence.



YANKEE ATOMIC ELECTRIC COMPANY

Rowe, Massachusetts 01367

August 31, 1984

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Subject: Licensee Event Report 50-29/84-13/Rev. 0

480 Volt Bus 4-1 Failure

Dear Sir:

In accordance with 10 CFR 50.73(a)(2)(i) and 50.73(a)(2)(x), the attached Licensee Event Report is hereby submitted.

Very truly yours,

Normand N. St. Laurent
Plant Superintendent

ELM
/
meg

Enclosure

cc: [3] NSARC Chairman (YAEC)
[1] Manager of Operational Quality Assurance (YAEC)
[1] Institute of Nuclear Power Operations (INPO)

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